Field Modification Form
Lower Passaic River Restoration Project
Current Conditions Monitoring Program
Project No: 60145884

Field Modification Number: FM-20190703-C1

Document (plan or SOP title and date): Current Conditions Monitoring Program, Physical Water Column Monitoring, Quality Assurance Project Plan/Field Sampling Plan Addendum, Lower Passaic River Restoration Project, June 2019 Revision 0

Activity: Addition of *in situ* probe for measurement of chlorophyll-a

Proposed Modification: Add *in situ* measurements of chlorophyll-a to the measurements being collected during transect surveys and equipment maintenance activities for the physical water column monitoring (PWCM) program.

Chlorophyll-a will be measured using a specialized probe attached to the vessel's array being used to measure *in situ* water quality parameters. Ocean Surveys, Inc. (OSI), the vessel subcontractor for the Current Conditions program, is obtaining a probe for these surveys. The probe is the YSI TAL-PC probe to be used with the YSI EXO2 unit. The specifications for the chlorophyll-a readings on the TAL-PC probe are as follows:

Range: 0 to 100 relative fluorescence units (RFU) or 0 to 400 micrograms per liter (µg/L) chlorophyll
Accuracy: Linearity of r^2 ≥ 0.999 for Rhodamine WT across full range
Resolution: 0.01 RFU or 0.01 µg/L chlorophyll
Operating temperature: -5 to 50°C
Storage temperature: -20 to 80°C
Depth rated to 250 meters

Per Worksheet No. 24 of the UFP-QAPP, the following summarizes the field equipment calibration, maintenance, testing and inspection:

Calibration Activity: The probes will be calibrated per the manufacturer's instructions prior to each event at the OSI offices, and post-calibration checks will be made upon completion of each field event. A 625 µg/L Rhodamine solution will be used to calibrate chlorophyll. The acceptance criterion on post-calibration is ±10%. Calibration records will be maintained by OSI and submitted with event data.

Maintenance Activity: Probes will be rinsed with clean river water or tap water between stations.

Testing Activity: Calibrate per manufacturer's specifications (see manual provided with equipment).

Inspection Activity: Daily for functionality.

Frequency: Calibrate before event and conduct post-event calibration check.

Acceptance Criteria: Goal is ±10% of solution post-check.

Corrective Action: Recalibrate or replace if needed.

Responsible Person: OSI, AECOM FTM, or designee
SOP Reference: LPR-FI-05

Effective Date: July 3, 2019

Rationale: The purpose of this change is to provide a large data set of chlorophyll-a data. These *in situ* data will be used to estimate the algal concentration in the water for contaminant partitioning modeling.

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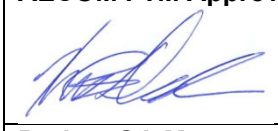
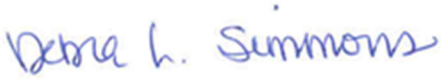
USEPA requested adding laboratory analysis of chlorophyll-a to the PWCM program. Due to the large number of samples (approximately 100) collected in short duration (2 to 3 days) and short holding time (24 to 48 hours, depending on laboratory), the local laboratories were unable to commit to processing the samples within holding time (the local ALS laboratory is already filtering organic carbon fractions in triplicate for PWCM). Chlorophyll-a is currently part of analytical suite for the 12-event small volume (SV) chemical water column monitoring (CWCM) program, which is being conducted concurrently with PWCM. The probes will also be added to the CWCM program QAPP, and the analytical data from the SV CWCM program will be used to confirm the *in situ* measurements. Agreement on this approach was confirmed during a conference call with USEPA, HDR, CDM-Smith, de maximus, AECOM and Anchor QEA on July 3, 2019.	
Submitted by: Kristen Durocher AECOM Field Task Manager (FTM)	**Date:** July 8, 2019
AECOM FTM Approval: 	**Date:** July 8, 2019
Project QA Manager Approval: Debra Simmons 	**Date:** July 8, 2019
Anchor QEA Project Manager Approval: James Rhea 	**Date: July 10, 2019**